

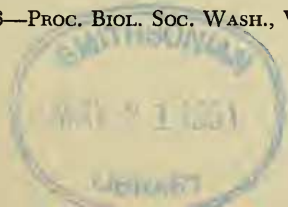
PROCEEDINGS
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SYNONYMICAL NOTES ON SOME SOUTH AMERICAN
SPECIES OF *GELASTOCORIS* KIRKALDY
(HEMIPTERA: GELASTOCORIDAE)

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De Carlo, 1954, *Misión de Estudios de Patología Regional Argentina*, 24(83-84): 87-102, proposed eight new specific names in the Gelastocorinae (Gelastocoridae: Hemiptera). In 1955, *Univ. Kansas Sci. Bull.*, 37, pt. 1(11): 332-335, 336-337, 339-342, I treated his names as synonyms of *Gelastocoris nebulosus* (Guérin-Méneville), *G. fuscus* Martin and *G. angulatus* (Melin). The latter species and its synonyms were placed by De Carlo in the genus *Montandonius* Melin. I treated *Montandonius* as, and still consider it to be, a junior synonym of *Gelastocoris* Kirkaldy. De Carlo has recently published, 1959 (1960), *Acta Zoologica Lilloana*, 17: 53-85, a second paper in which he maintains that most of his specific names apply to valid species and that *Montandonius* Melin (1929: 154, 169) is a distinct genus. He also proposes another new specific name, *Gelastocoris monrosi*.

After a careful review of De Carlo's papers and a restudy of the species concerned, it is very obvious that we have very different concepts of species insofar as the Gelastocorinae are concerned. Accordingly, I do not wish to become further involved in an argument based on differences of opinion. However, since De Carlo has utilized some different characters in defining his species in his second paper, since he has modified some of his original illustrations and included additional ones, and since his names must be treated in a checklist of the family, now in preparation, I feel obligated to discuss his names once more. I shall then trust to other workers in Hemiptera, both of the present and future, and to future develop-



ments in our knowledge of the Gelastocoridae to determine which of the two specific concepts is correct.

Four of the names proposed by De Carlo in 1954, *i.e.*, *Gelastocoris vianai*, *G. bergi*, *G. paraguayensis* and *G. bolivianus*, are in my opinion synonyms of *G. nebulosus* (Guérin-Méneville) and were so placed by me in 1955. The new name proposed by De Carlo in his last paper, *Gelastocoris monrosi*, I also place in the synonymy of *nebulosus*, but I must admit that I do not now have specimens that agree in all respects with those so named by De Carlo.

The male genitalia of *nebulosus* differs from those of the other species in that the tumescence of the right clasper is adnate to the base of the clasper; the pan more or less flat, wider than long and truncate or slightly rounded apically; the keel hook recurved back across the pan; and the right clasper hook, stout, with a large lateral projection which gives the hook a footlike appearance. The male genitalia of all five of the De Carlo species mentioned above agree with those of *nebulosus*. The slight differences in the shape and size of the keel hook which De Carlo considers in his latest paper to be constant, but which he did not mention or illustrate in his first paper, are in my opinion merely variations of this structure within the species *nebulosus*. Martin (1929: 356) was of the same opinion. He stated: "The hook on the distal end of the keel (keel hook) has a characteristic shape for each species that possesses it. In some species there is quite a range of variation in the size of this hook. In the species *G. quadrimaculatus* (Guer.) the size and shape might be quite misleading unless one is familiar with the species." *G. quadrimaculatus* (Guer.) is the name Martin used for *nebulosus*! Unfortunately, in 1954, De Carlo overlooked the generic revision by Martin.

G. nebulosus (Guérin-Méneville)

De Carlo treated this name as a synonym of *G. flavus* (Guérin-Méneville) in 1954, but he reverses the usage in 1959(1960). He follows my explanation (1955: 334-335) as to why the name *nebulosus* must be used for the species. Also he now states that his *vianai* is the "true" *nebulosus* and places *vianai* as a synonym of the latter. So, we are in agreement that *vianai* De Carlo is a synonym of *nebulosus*.

G. quadrimaculatus (Guérin-Méneville)

In 1954 De Carlo followed Montandon (1910: 2) and Hussey (1952:

70) in considering *quadrimaculatus* to be an older name for *G. vicinus* Champion. However, I showed (1955: 321-322) that his synonymy was extremely unlikely. In his latest paper De Carlo has applied the name to specimens which I consider to be *nebulosus*, but which he insists are specifically distinct. He also places the specimens he identified as *G. flavus* (Guérin-Méneville) and *G. bergi* De Carlo in 1954 as the same species. This last action is difficult to understand because in 1954 he stated that *bergi* differed from *flavus* by the shape of the pronotum, by having the tubercles of the pronotum a little more pronounced, by the crossing of the hemelytra less, by the different shape of the harpes (parameres) and in the presence of granulations numbers 9 and 10 on the hemelytra. Yet he insists that comparable differences of the same structures are of importance in the separation of *quadrimaculatus*, *nebulosus*, *bolivianus*, *paraguayensis* and *monrosi*.

There are two specimens before me that exhibit an identical pattern of coloration to that given by De Carlo for *quadrimaculatus*. One of these, a specimen from Argentina from the Museum of Vienna, Austria, has granulation number 10 present. Therefore one may conclude that the name *quadrimaculatus* might also be applied to the specimens called *bolivianus* by De Carlo, or that the presence or absence of granulation number 10 is not of specific value. The other specimen with the "quadrimaculatus" type of coloration does not possess granulation number 10. The specimen is from Organ Mountains, Minas Gerais, Brazil, and is in the United States National Museum.

G. bolivianus De Carlo

I agree with De Carlo that the blisterlike granulations of the hemelytra of specimens of *nebulosus* from Bolivia are usually more prominent, with numbers 9 and 10 of De Carlo usually developed and with the membrane frequently reduced. I do not, however, consider these variations to be of specific value. Specimens of *nebulosus* from other areas of South America may also have enlarged granulations and may even possess granulations such as 9 and 10, as indicated above in the discussion of *quadrimaculatus* of De Carlo. Some of the other specimens in the United States National Museum from the series from Organ Mountains, Minas Gerais, Brazil, have granulations 9 and 10 slightly developed. The reduction of the membrane is commonly observed in specimens from the Andean regions in other species as well as in *nebulosus*.

G. paraguayensis De Carlo

I have not observed any constant differences in the elevations or depressions of the pronotum or the scutellum in the series of specimens of *nebulosus*. I cannot, therefore, accept De Carlo's statements that there are constant differences in these structures. De Carlo also states that the shape and size of the keel hook is constant for this species and different from *nebulosus*, *quadrimaculatus*, etc. I have already discussed in this paper the variation of the keel hook in *nebulosus*. De Carlo states,

1959(1960) in "Remarks" under *paraguayensis* that if I had carefully observed his drawing, Fig. 8, Plate 2, p. 91 in his original paper that I would not have considered *paraguayensis* to be a synonym of *nebulosus*. I still fail to see any specific differences in the drawing. The illustration of *paraguayensis*, is smaller than the others, but then the specimen was smaller. Even so, it is only slightly smaller than the illustration of the genitalia of *vianai*, Fig. 10 which De Carlo now claims is the same as *flavus* Guérin-Méneville of De Carlo, 1954, illustrated in Fig. 7.

G. monrosi De Carlo

I place this name also as a synonym of *nebulosus* because the genitalia as illustrated by De Carlo (1959(1960): Figs. 22-25) belong to *nebulosus* as I consider the species. I do not have any specimens before me in which the posterior margin of the seventh abdominal sternite is formed as in Figs. 39 and 40 of De Carlo's last paper. The small specimens from Plaumann, referred to by De Carlo are in the collection of the University of Kansas. I do have three males from the collections of the United States National Museum, from Ceara, Brazil that are even smaller than those called *monrosi* by De Carlo. These range from 5.4 to 5.7 mm in length and 3.7 to 3.8 mm in width. The genitalia are not unlike those figured by De Carlo, but the posterior margin of the seventh abdominal sternite is like that in the larger specimens of *nebulosus*.

In the course of my studies of the Gelastocoridae, I have examined more than 800 specimens of *G. nebulosus* (Guérin-Méneville). It is an extremely variable species. My conclusion that it is a variable species and not a complex is based on the variation found in other species of *Gelastocoris* as well as in *Nerthra* Say, on a comparative study of differences in the male genitalia of the species of *Gelastocoris* and on the lack of constancy of the variations of specimens of *nebulosus*. I am fully aware that complexes of closely related species do occur, in fact, I have named entities that I believed belonged to such complexes. Furthermore, I know that within such complexes, any morphological structure, *i.e.*, male genitalia, may indeed be very similar in the species concerned. Nevertheless, it is my opinion that *nebulosus* does not represent such a complex. It is true that I have not seen, or at least have not recognized, specimens in which the seventh abdominal sternite is modified as described by De Carlo for *monrosi*. If the difference is real and not due to distortion resulting from methods of preservation or preparation, and if it develops that the difference is constant and that the specimens are geographically isolated from *nebulosus*, then *monrosi* should be considered to be a subspecies of *nebulosus*. More collections and further study will be required, however, before the proper status of the name can be determined. Further biological and ecological studies are certainly needed. We know, for example, that some species of *Gelastocoris* sometimes are found in colonies or in aggregates in small areas along the margins of bodies of water. But we do not know whether such aggregations represent the offspring of one or a few females or whether

specimens of quite different ancestries have collected in such an area because of an abundant food supply or for some other reason. We do not know, therefore, how to evaluate the individual variations found in such populations. Many other similar problems undoubtedly will need to be resolved before we can accurately discuss the species, subspecies and forms of *Gelastocoris*.

G. martinezi De Carlo

This is clearly a synonym of *G. fuscus* Martin. As stated before, De Carlo was not aware of Martin's study of the genus. Therefore, when De Carlo described *martinezi*, he did not compare it with *fuscus*. In his more recent paper, De Carlo maintains that the two differ in the shape of the right clasper hook and in the shape of the lateral margin of the pronotum, especially the posterior part. The right clasper hook is quite variable in this species as in the other species of *Gelastocoris*. Martin, 1929, illustrated some of the variation found in this species in Figs. 17, 19A and 19B. De Carlo refigured Martin's Fig. 19A, but not 19B which more nearly approaches the shape of the right clasper hook of his *martinezi*. I illustrated another variation, Fig. 40, in 1955. After the examination of one paratype of *fuscus*, De Carlo remarks that my illustration is incorrect, but it was made from one of the specimens in the collection of the University of Kansas. Furthermore, there is a specimen from Rurrenabaque, Beni, Bolivia, in the United States National Museum that has the right clasper hook similarly formed. The right clasper hook is not at all heavily sclerotized in this species. In fact, in some specimens it is rather membraneous basally and along the outer margin. Consequently when specimens are relaxed for dissection, it is frequently found to be extremely pliable and may dry in various positions according to the degree of sclerotization of the hook. A series of males in the United States National Museum collected in Bolivia by W. M. Mann in 1921-22 demonstrate the range of variation to be found in the right clasper hook. In the genitalia of *fuscus* the shape of the pan, the shape of the keel hood and the extent of the fringe of the keel hood are distinctive. The series of males from Bolivia mentioned above also show that the supposed difference in the shape of the lateral margin of the pronotum is not constant and that it too is a variable character.

G. angulatus (Melin)

Three names proposed by De Carlo, *i.e.*, *Montandonius willineri*, *M. mansosotoi* and *M. bridarollii*, I treated as synonyms of *angulatus* in 1955. I also placed *angulatus* in *Gelastocoris* since I did not consider the differences utilized by Melin and De Carlo to be generic. *G. angulatus* is, indeed, a very distinct species, but I feel the relationship to the other species can best be expressed by including *angulatus* in *Gelastocoris*. The situation is comparable to that of *Nerthra tuberculata* (Montandon) and the other species of the *alaticollis* group in Australia. In 1954 De Carlo stated that one of the main differences between the two genera

was that *Montandonius* species lacked a clavus. I pointed out, in 1955, however, that *angulatus* does have a clavus and that the species is variable in the development of the claval suture on the upper surface of the hemelytra. Mr. Izzard of the British Museum (Natural History), at De Carlo's request, confirmed the existence of a clavus in *angulatus*. De Carlo, thus, abandoned this character in his subsequent generic diagnosis, but states that his three species differ from *angulatus* in that they lack a clavus.

G. angulatus does have the apex of the head truncate or slightly concave whereas in the other species of *Gelastocoris* it is rounded. There are six small, longitudinal carinae on the posterior part of the pronotum of *angulatus* which are not found in the other species. The blisterlike granules are mostly elevated in *angulatus*, but the number, degree of elevation and coloration of the granulations is variable. De Carlo has used such differences in separation of his species. In the majority of the other species of *Gelastocoris* the blisterlike granules are only rarely elevated to the degree usually found in specimens of *angulatus*, and even then only a few granulations are elevated. In *G. major* Montandon, however, the blisterlike granules are generally elevated and approach those of some specimens of *angulatus*. The embolium of *angulatus* is usually a little wider than in the other species, but it too is variable and differences in the width of expansion of the embolium have also been used by De Carlo to separate his species. The rugosity of the front of the head is variable as in the other species and not noticeably rougher than some specimens of other species, *i.e.*, *major*, *fuscus* and even *nebulosus*. The lateral expansion of the pronotum is not proportionally greater than that of *bufo*, as has been stated by De Carlo. The posterior portion of the lateral margin of the pronotum is usually more convex than in the other species.

In consideration of the above comments, I feel that generic separation of *angulatus* is not warranted. On the other hand, if I believed that *angulatus* was, in fact, a complex of species, I probably would agree with De Carlo that *Montandonius* should be used to separate those species from the species of *Gelastocoris*. But, I do not consider that De Carlo's names apply to valid species.

M. willineri De Carlo

De Carlo states (1959(1960): 82) that I was in error in treating this species as a synonym of *angulatus* because the shape of the right clasper hook is obviously different according to Figs. 49, p. 76 and 59, p. 81. I admit the figures appear very different, but this is not surprising since they do not represent the same aspect. Figure 49 of De Carlo represents a lateral view, not a ventral view as in Fig. 59. This is certain because the peglike spines of the right paramere occur on the dorsal surface of the paramere and are not visible in a ventral view in *angulatus*. They are shown in the illustration of *willineri*. Furthermore, the right clasper hook of specimens of *angulatus* have the appearance of that figured for

willineri when viewed from the right side. De Carlo states that he mounted the genitalia of his species on slides, so it seems likely that the genitalia of his single male specimen of *angulatus* (his *willineri*) somehow came to rest so that a lateral aspect was presented. I should also comment at this point that the right clasper hook is also variable in shape and size in *angulatus* as in the other species of *Gelastocoris*. The width of the shaft, the total length and the shape is variable. In one male, now before me, a specimen from Rurrenabaque, Beni, Bolivia, in the United States National Museum, the apical, recurved part is scarcely developed. The other differences between *willineri* and *angulatus*, as well as between *willineri* and the other two De Carlo species referred to *Montandonius*, are in my opinion merely individual variation within the species.

M. mansosotoi De Carlo and *M. bridarollii* De Carlo

I consider the female specimens so named to be *angulatus*, and the differences listed by De Carlo to be only variations found in those species. In his last paper, De Carlo has illustrated, Fig. 56, p. 81, the right ovipositor for his species *mansosotoi*. It should be noted that this figure does not agree with the illustration, Fig. 18, of the ovipositor of the same species presented in 1954. Fig. 56, lacks many of the spines shown in Fig. 18.

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